



# NCERT



# CHAPTER WISE TOPIC WISE

## LINE BY LINE QUESTIONS

## 2024



BY  
SCHOOL OF  
EDUCATORS

Atomic Number

DOBEREINER'S TRIAD (1892)

Middle element of each triad had an atomic weight about half way between the atomic weight of either two and also properties between the other two.

## LOTHER MEYER

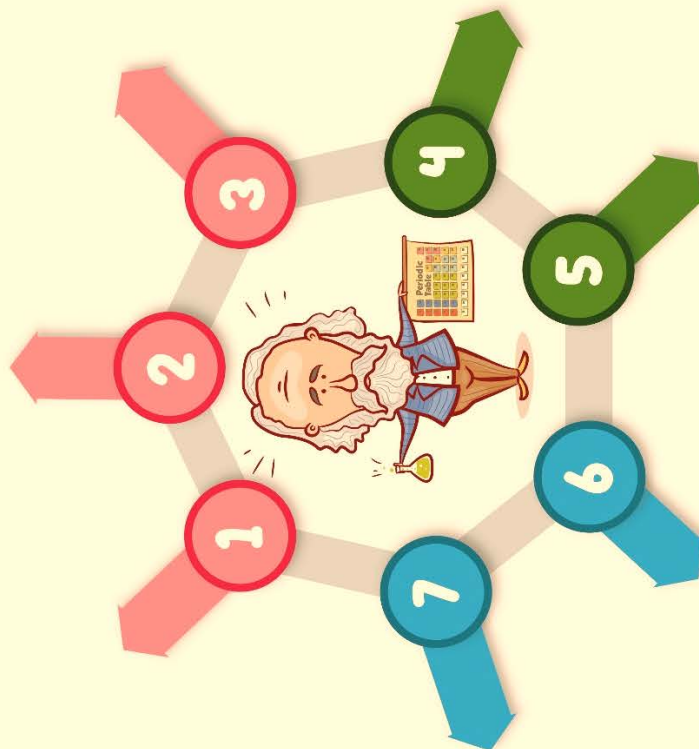
Lothumeya found a periodic pattern by plotting physical properties like atomic volume, B.P and M.P against atomic weight.

**MENDELEEV PERIODIC LAW**

Properties of elements are a periodic function of their atomic weights.

To make it easier to understand the chemistry of all the elements and their compounds separately.

	properties	Group	Period
(a)	Atomic Radius Distance between the Atomic nucleus and the outermost shell containing electron.	Increases	Decreases
(b)	Electron Gain Enthalpy Energy released when an electron is added to the valance shell of an isolated Gaseous Atom.	Decreases	Increases
(c)	Ionisation Energy Amount of energy required to remove an electron from an isolated gaseous atom.	Decreases	Increases
(d)	Electronegativity Tendency of an element to attract shared electrons towards itself.	Decreases	Increases
(e)	Metallic Character	Increases	Decreases
(f)	Non-Metallic Character	Decreases	Increases



- The valance or representative elements is generally equal to valence electron or (s+valence electrons).
- Anomalous behaviour of 2nd period elements is due to their small size, large charge/radius ratio, high electronegativity and only 4 valence orbitals.
- Diagonal relationship: Li and Be is more similar to Mg and Al respectively.
- The normal oxides formed by the element on extreme left is most basic (e.g. Na<sub>2</sub>O) and formed by elements on extreme right is most acidic (e.g. Cl<sub>2</sub>O).
- Oxides of centre elements are amphoteric (e.g. Al<sub>2</sub>O<sub>3</sub>) or neutral (e.g. N<sub>2</sub>O).
- Amphoteric oxides are basic in acidic medium and vice versa.

# CLASSIFICATION OF ELEMENTS AND PERIODICITY IN PROPERTIES

## STUDY OF PERIODIC TABLE

Derived from Atomic Number of Element  
Using Numerical Roots  
for 0 and Number 1-9  
and 'um' is added at  
end of name

Digit	Name	Abbreviation
0	nit	N
1	UN	U
2	bi	b
3	tri	t
4	quad	q
5	pent	p
6	hex	N
7	Sept	S
8	oct	o
9	enn	e

## NOMENCLATURE OF ELEMENTS (ATOMIC NO. &gt; 100)

## MODERN PERIODIC TABLE

- Modern Periodic Law: Physical and chemical properties of elements are periodic functions of their atomic number.
- Father of modern periodic table: **Dimitri Mendeleev**
- 7 Horizontal rows: Periods: 18 Vertical columns: Groups

[illegible]

## S-Block Elements

- (ii) Electronic configuration:  $ns^{1-2}$
- (iii) Consist of Group 1 (alkali metals)
- (iii) and also group 2 (alkali earth metals)

## Block Elements

- (ii) Electronic configuration:  $(n-1)d^{1-10}ns^2$
- (iii) Consist of Group 3 to 12
- (iv) Also known as transition elements

## Block Elements

- (ii) Electronic configuration:  $(n-2)f^{0-14}(n-1)d^{0-10}ns^2$  (Z = 58-71) (Z = 90-103)



## NCERT LINE BY LINE QUESTIONS

**(1.) Assertion :** The elements beryllium, antimony, arsenic and tellurium have characteristics of both metals and non-metals.

**Reason:** The metallic character increases as we go from left to right across the periodic table.

- |   |   |
|---|---|
| (a.) Both A and R are true and R is the correct explanation of A. | (b.) Both A and R are true but R is not the correct explanation of A. |
| (c.) A is true but R is false.                                    | (d.) Both A and R are false.  |

**(2.)** Which of the following elements has highest first ionization enthalpy?

- |        |         |
|--------|---------|
| (a.) P | (b.) C  |
| (c.) O | (d.) Ne |

**(3.)** If atomic weights of lithium and potassium are 7 and 39 respectively, then what is the atomic weight of sodium according to Dobereiner's law of triads?

- |         |         |
|---------|---------|
| (a.) 25 | (b.) 23 |
| (c.) 14 | (d.) 78 |

**(4.)** Select the correct order of size of the given species.

- |                      |                      |
|----------------------|----------------------|
| (a.) $I^- > I > I^+$ | (b.) $I > I^- > I^+$ |
| (c.) $I > I^+ > I^-$ | (d.) $I^+ > I^- > I$ |

**(5.)** The sixth period contains 32 elements and successive electrons enter in the orbitals of

- |                         |                         |
|-------------------------|-------------------------|
| (a.) 5s, 4f, 5d and 4p. | (b.) 6s, 3f, 4d and 5p. |
| (c.) 5s, 4f, 6d and 6p. | (d.) 6s, 4f, 5d and 6p. |

**(6.)** The size of an anion will be larger than that of the parent atom because

- |  |   |
|--|---|
| (a.) The addition of one or more electrons would result in decreased repulsion among the electron and a increase in effective nuclear charge.  | (b.) The removal of one or more electrons results in increased attraction among the electrons.  |
| (c.) The addition of one or more electrons would result in increased repulsion among the electrons and a decrease in effective nuclear charge. | (d.) The addition of one or more electrons results in decreased attraction among the electrons. |

**(7.)** Identify the oxide which is amphoteric in nature.

- |                |              |
|----------------|--------------|
| (a.) $Al_2O_3$ | (b.) NO      |
| (c.) $Cl_2O_7$ | (d.) $Na_2O$ |

**(8.)** Some properties of inner-transition elements are given below. Choose the incorrect statements.

- (I) They are all non-metals.  
 (II) Within each series, the properties of the elements are not similar.  
 (III) The chemistry of the early actinoids is more simple than the corresponding lanthanoids.

- (a.) I and II  
(b.) II and III  
(c.) I and III  
(d.) I, II and III

(9.) Seaborg was awarded the Nobel Prize in Chemistry for his work. What name has been given to an element in his honour?

- (a.) Tantalum  
(b.) Molybdenum  
(c.) Iridium  
(d.) Seaborgium

(10.) Some order and their respective properties are given below. Choose the correct one.

- (a.)  $\text{Na} < \text{Mg} < \text{Be}$ : Metallic character  
(b.)  $\text{K} < \text{Rb} < \text{Cs}$ : Reactivity  
(c.)  $\text{Cl} < \text{S} < \text{P}$ : Non-metallic character  
(d.)  $\text{Br} < \text{Se} < \text{As}$ : Electron gain enthalpy

(11.) Some properties for the noble gases are given below. Choose the correct statements.

- (I) All the orbitals in the valence shell are completely filled by electrons.  
(II) Very difficult to alter the electronic arrangement by the addition or removal of electron.  
(III) Exhibit very high chemical reactivity.

- (a.) I and III  
(b.) II and III  
(c.) I and II  
(d.) I, II and III

(12.) The period number in the long form of the periodic table is equal to

- (a.) maximum principal quantum number of any element of the period.  
(b.) magnetic quantum number of any element of the period.  
(c.) maximum Azimuthal quantum number of any element of the period.  
(d.) atomic number of any element of the period.

(13.) What are the oxidation state and covalency respectively of Al in  $[\text{AlCl}(\text{H}_2\text{O})_5]^{2+}$ ?

- (a.) 3 and 6  
(b.) 6 and 3  
(c.) 2 and 6  
(d.) 6 and 2

(14.) What is the symbol of the element Meitnerium.

- (a.) Md  
(b.) Mt  
(c.) Mo  
(d.) Mn

(15.) Match the oxide given in column I with its property given in column II.

	Column - I		Column - II
(P.)	$\text{Na}_2\text{O}$	(i.)	Neutral
(Q.)	$\text{Al}_2\text{O}_3$	(ii.)	Basic
(R.)	$\text{N}_2\text{O}$	(iii.)	Acidic
(S.)	$\text{Cl}_2\text{O}_7$	(iv.)	Amphoteric

Which of the following option has all correct pairs?

- (a.) (i) - (B), (ii) - (D), (iii) - (A), (iv) - (C)  
(b.) (i) - (B), (ii) - (A), (iii) - (D), (iv) - (C)  
(c.) (i) - (C), (ii) - (B), (iii) - (A), (iv) - (D)  
(d.) (i) - (A), (ii) - (D), (iii) - (B), (iv) - (C)

(16.) Which of the given periodic trends is correct?



- (a.) Electronegativity increases down the group.
- (b.) Ionization enthalpy increases down the group.
- (c.) Atomic radius increases down the group.
- (d.) Electron gain enthalpy increases down the group.

(17.) A quantitative measure of the tendency of an element to lose electron is given by its

- (a.) electronegativity.
- (b.) electron gain enthalpy.
- (c.) ionization enthalpy.
- (d.) electronegativity and ionization enthalpy.

(18.) **Assertion:** Mendeleev periodic table had left the gap under aluminium and a gap under silicon, and called these elements Eka-Aluminium and EkaSilicon.

**Reason:** The elements gallium and germanium were known at that time Mendeleev published his periodic table.

- (a.) Both A and R are true and R is the correct explanation of A.
- (b.) Both A and R are true but R is not the correct explanation of A.
- (c.) A is true but R is false.
- (d.) Both A and R are false.

(19.) **Assertion:** The elements become more metallic as we go from left to right across the periodic table.

**Reason:** The elements become more non-metallic as we go down a group.

- (a.) Both A and R are true and R is the correct explanation of A.
- (b.) Both A and R are true but R is not the correct explanation of A.
- (c.) A is true but R is false.
- (d.) Both A and R are false.

(20.) The ionic radii can be estimated by measuring the distances between

- (a.) anions and anions in ionic crystals.
- (b.) cations and cations in ionic crystals.
- (c.) cations and anions in ionic crystals.
- (d.) None of these.

(21.) A qualitative measure of the ability of an atom in a chemical compound to attract shared electrons to itself is called

- (a.) electron gain enthalpy.
- (b.) ionization enthalpy.
- (c.) electronegativity.
- (d.) stability.

(22.) Which of the following oxides is most acidic in nature?

- (a.) MgO
- (b.) BeO
- (c.) BaO
- (d.) CaO

(23.) The first and the last of lanthanoids elements are

- (a.) Th and Lr
- (b.) Ce and No
- (c.) La and Lu
- (d.) Ce and Lu

(24.) What is the atomic number of the element which is considered as last element of the 3d series?

- (a.) 30
- (b.) 40
- (c.) 20
- (d.) 25

(25.) **Assertion:** A qualitative measure of the ability of an atom in a chemical compound to attract shared electrons to itself is called electronegativity.

**Reason:** The ionization enthalpy, electron gain enthalpy and electronegativity are measurable quantity.

- (a.) Both A and R are true and R is the correct
- (b.) Both A and R are true but R is not the

explanation of A.

correct explanation of A.

(c.) A is true but R is false.

(d.) Both A and R are false.

(26.) According to Mendeleev's periodic table, which of the following elements has formula of oxide as  $R_2O_3$ ?

(a.) B

(b.) Be

(c.) Li

(d.) C

(27.) Which of the following is the correct order with respect to first ionization enthalpies?

(a.)  $Li < Na < K < Rb$

(b.)  $Rb > K > Na > Li$

(c.)  $Na < Li < K < Rb$

(d.)  $K > Rb > Na > Li$

(28.) Select the correct statement.

(a.) Reactivity of the alkali metals decreases down the group.

(b.) Reactivity of the halogens decreases down the group.

(c.) Reactivity of alkali metals and halogens decreases down the group.

(d.) Reactivity of alkali metals and halogens increases down the group.

(29.) Combination of which two blocks elements are also called representative elements .

(a.) s-block and d-block

(b.) s-block and d-block

(c.) s-block and p-block

(d.) d-block and f-block

(30.) **Assertion:** Energy is always required to remove electrons from an atom and hence ionization enthalpies are always negative.

**Reason:** The second ionization enthalpy will be lower than the first ionization enthalpy.

(a.) Both A and R are true and R is the correct explanation of A.

(b.) Both A and R are true but R is not the correct explanation of A.

(c.) A is true but R is false.

(d.) Both A and R are false.

(31.) The maximum number of elements that can be accommodated in fifth period is

(a.) 8

(b.) 18

(c.) 32

(d.) 20

(32.) Which among the following are the isoelectronic Species?

(a.)  $Mg^{2+}$ ,  $Cl^-$  and  $Na^+$

(b.)  $O^{2+}$ ,  $P^-$  and  $Mg^{2+}$

(c.)  $Na^+$ ,  $O^{2-}$  and  $F^-$

(d.)  $Cl^-$ ,  $F^-$  and  $O^{2+}$

(33.) The electronic configurations of Eu (Atomic No. 63), Gd (Atomic No. 64) and Tb (Atomic No. 65) are

(a.)  $[Xe]4f^7 6s^2$ ,  $[Xe]4f^8 6s^2$  and  $[Xe]4f^8 5d^1 6s^2$

(b.)  $[Xe]4f^7 5d^1 6s^2$ ,  $[Xe]4f^7 5d^1 6s^2$  and  $[Xe]4f^9 6s^2$

(c.)  $[Xe]4f^6 5d^1 6s^2$ ,  $[Xe]4f^7 5d^1 6s^2$  and  $[Xe]4f^8 5d^1 6s^2$

(d.)  $[Xe]4f^7 6s^2$ ,  $[Xe]4f^7 5d^1 6s^2$  and  $[Xe]4f 6s^2$

(34.) The physical and chemical properties of the elements are periodic functions of their

(a.) volume.

(b.) densities.

(c.) atomic masses.

(d.) atomic numbers.

(35.) The d-block elements in the periodic table lie in the group from

(a.) 4 to 11

(b.) 3 to 12



(c.) 3 to 13

(d.) 4 to 14

(36.) The distribution of electrons into orbitals of an atom is called its

(a.) shell.

(b.) electronic configuration.

(c.) series.

(d.) block.

(37.) Which of the following is correct with respect to electronegativity, metallic and non-metallic character of the elements?

(a.) The increase in electronegativity across a period is accompanied by an increase in nonmetallic properties of elements.

(b.) The increase in electronegativity down a group is accompanied by a decrease in nonmetallic properties of elements.

(c.) Electronegativity is inversely related to the non-metallic properties of elements.

(d.) Electronegativity is directly related to the metallic properties of elements.

(38.) A plot of  $\sqrt{\nu}$  against atomic number (Z) gave a straight line and not the plot of  $\sqrt{\nu}$  against atomic mass. Which of the following scientist observed such regularities in the characteristics X-ray spectra of the element?

(a.) Dmitri Mendeleev

(b.) Henry Moseley

(c.) A. H. B. de Chancourtois

(d.) Alexander Newlands

(39.) Which of the following statements regarding ionization enthalpy is correct?

(a.) The first ionization enthalpy will be higher than the second ionization enthalpy.

(b.) The second ionization enthalpy will be higher than the first ionization enthalpy.

(c.) The second ionization enthalpy will be higher than the third ionization enthalpy.

(d.) The first ionization enthalpy will be higher than the third ionization enthalpy.

(40.) Fourth period ended with element of

(a.) xenon.

(b.) krypton.

(c.) silver.

(d.) copper.

(41.) Which of the following groups of elements has highly negative electron gain enthalpies

(a.) Halogen group

(b.) Chalcogens group

(c.) Alkaline earth metal group

(d.) Alkali metal group

(42.) Which of the following is the correct statement.

(a.) The cation with the greater positive charge will have a smaller radius.

(b.) The anion with the greater negative charge will have the smaller radius.

(c.) The cation with the lower positive charge will have a smaller radius.

(d.) The anion with the lower negative charge will have the larger radius.

(43.) Transition elements in the periodic table started from the atomic number

(a.) 20

(b.) 21

(c.) 22

(d.) 24

(44.) **Assertion:** The atomic size generally decreases across a period.

**Reason:** Effective nuclear charge increases as the atomic number increases across a period.

(a.) Both A and R are true and R is the correct

(b.) Both A and R are true but R is not the

explanation of A.

correct explanation of A.

(c.) A is true but R is false.

(d.) Both A and R are false.

**(45.)Assertion:** The two rows of elements at the bottom of the periodic table are called the lanthanoids and actinoids.

**Reason:** The elements after uranium are called trans-uranium elements.

(a.) Both A and R are true and R is the correct explanation of A.

(b.) Both A and R are true but R is not the correct explanation of A.

(c.) A is true but R is false.

(d.) Both A and R are false.

**(46.)**Which of the following properties does not belong to the *d*-block elements ?

(a.) They exhibit specific oxidation states.

(b.) They are all metals.

(c.) They are mostly formed of coloured ions.

(d.) They are often used as catalyst.

**(47.)**Consider the two oxygen containing compounds  $\text{OF}_2$  and  $\text{Na}_2\text{O}$ . The order of electronegativity of the three elements involved in these compounds is

(a.)  $\text{F} > \text{Na} > \text{O}$

(b.)  $\text{F} > \text{O} > \text{Na}$

(c.)  $\text{Na} > \text{F} > \text{O}$

(d.)  $\text{O} > \text{F} > \text{Na}$

**(48.)**Which of the given element has highest electronegativity value as per Pauling scale?

(a.) Si

(b.) S

(c.) Be

(d.) Mg

**(49.)**Gadolinium belongs to 4f series. Its atomic number is 64. Which of the following is the correct electronic configuration of gadolinium

(a.)  $[\text{Xe}]4f^7 5d^1 6s^2$

(b.)  $[\text{Xe}]4f^6 5d^2 6s^2$

(c.)  $[\text{Xe}]4f^8 6d^2$

(d.)  $[\text{Xe}]4f^5 d^1$

**(50.)Assertion:** Henry Moseley observed regularities in the characteristic X-ray spectra of element. A plot of  $\sqrt{\nu}$  (  $\nu$  is frequency.) against atomic number (*Z*) gave a straight line.

**Reason:** Henry Moseley showed that the atomic number is a more fundamental property of an element than its atomic mass.

(a.) Both A and R are true and R is the correct explanation of A.

(b.) Both A and R are true but R is not the correct explanation of A.

(c.) A is true but R is false.

(d.) Both A and R are false.

## TOPIC WISE NEET PRACTICE QUESTIONS

### TOPIC 1: Mendeleev and Modern Periodic Table



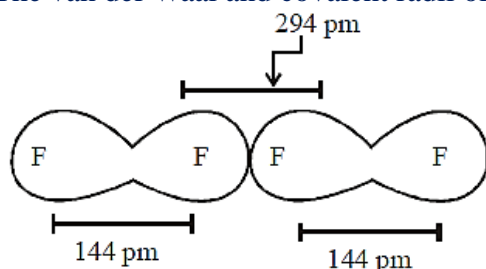
1. The molecular formula of chloride of Eka-Aluminium and Eka-Silicon respectively are  
1) GaCl<sub>3</sub> and SiO<sub>4</sub>                      2) GaCl<sub>3</sub> and AlCl<sub>3</sub>    3) AlCl<sub>3</sub> and SiCl<sub>4</sub>    4) GaCl<sub>3</sub> and GeCl<sub>4</sub>
2. Representative elements belong to  
1) *s*- and *p*-blocks                      2) *p*- and *d*-blocks    3) *f*-block only                      4) *d*- and *f*-blocks
3. The tenth element in the periodic table resembles the element with atomic number  
1) 2 and 30                      2) 8 and 18                      3) 2 and 54                      4) 8 and 54
4. The elements with atomic numbers 9, 17, 35, 53 and 85 belong to  
1) alkali metals                      2) alkaline earth metals  
3) halogens                      4) noble gases
5. The element Z = 114 has been discovered recently. It will belong to which of the following family group and electronic configuration?  
1) Halogen family [Rn] 5f<sup>14</sup> 6d<sup>10</sup> 7s<sup>2</sup> 7p<sup>5</sup>                      2) Carbon family [Rn] 5f<sup>14</sup> 6d<sup>10</sup> 7s<sup>2</sup> 7p<sup>2</sup>  
3) Oxygen family [Rn] 5f<sup>14</sup> 6d<sup>10</sup> 7s<sup>2</sup> 7p<sup>4</sup>                      4) Nitrogen family [Rn] 5f<sup>14</sup> 6d<sup>10</sup> 7s<sup>2</sup> 7p<sup>3</sup>
6. The most abundant element in the universe is thought to be  
1) carbon                      2) oxygen                      3) hydrogen                      4) nitrogen
7. Element with atomic number 47 belongs to the period .....and the group .....  
1) 4th, 12th                      2) 4th, 11th                      3) 5th, 12th                      4) 5th, 11th
8. Which of the following is the atomic number of a metal–  
1) 32                      2) 34                      3) 36                      4) 38
9. What is the IUPAC name of the element with atomic number 114 ?  
1) Unununnium                      2) Unnilquadium                      3) Ununquadium                      4) Unnilennium.
10. The element with atomic number 118, will be  
1) alkali                      2) noble gas                      3) lanthanide                      4) transition element
11. If the atomic number of an element is 33, it will be placed in the periodic table in the  
1) first group                      2) third group                      3) fifth group                      4) seventh group.
12. The long form of periodic table consists of  
1) Seven periods and eight groups                      2) seven periods and eighteen groups  
3) Eight periods and eighteen groups                      4) eighteen periods and eight groups
13. Elements of which group form anions most readily?  
1) Oxygen family                      2) Nitrogen family                      3) Halogens                      4) Alkali metals
14. Element with electronic configuration 1s<sup>2</sup> 2s<sup>2</sup> 2p<sup>6</sup> 3s<sup>2</sup> 3p<sup>6</sup> 3d<sup>10</sup> 4s<sup>2</sup> 4p<sup>6</sup> 4d<sup>10</sup> 5s<sup>2</sup> 5p<sup>3</sup> belongs to the following group of the periodic table  
1) 2nd                      2) 5<sup>th</sup>                      3) 3rd                      4) 7th
15. Element having atomic no. of 56 belongs to which of the following block of periodic table?  
1) *p*- block                      2) *d*-block                      3) *f*- block                      4) *s*-block
16. Which of the following pairs has both members from the same period of the periodic table.  
1) Na – Ca                      2) Na – Cl                      3) Ca – Cl                      4) Cl – Br
17. Which group of the periodic table contains coinage metal ?  
1) IIA                      2) IB                      3) IA                      4) None of these
18. Which of the following period contain most of the manmade radioactive elements?  
1) Seventh                      2) Fifth                      3) Sixth                      4) Both 1) and 3)
19. Element X forms a chloride with the formula XCl<sub>2</sub>, which is a solid with a high melting point. X would most likely be in the same group of the periodic table as –  
1) Na                      2) Mg                      3) Al                      4) Si
20. An element has electronic configuration 1s<sup>2</sup>2s<sup>2</sup>2p<sup>6</sup>3s<sup>2</sup>3p<sup>4</sup>.  
1) Period = 3rd, block = *p*, group = 16                      2) Period = 5th, block = *s*, group = 1  
3) Period = 3rd, block = *p*, group = 10                      4) Period = 4th, block = *d*, group = 12
21. Which of the following is the artificial element in the periodic table ?  
1) Tc                      2) Te                      3) Ru                      4) Os

## TOPIC 2: Atomic Radii, Ionic Radii and Ionization Energy

22. The correct order of radii is  
1) N < Be < B                      2) F<sup>-</sup> < O<sup>2-</sup> < N<sup>3-</sup>                      3) N < Li < K                      4) Fe<sup>3+</sup> < Fe<sup>2+</sup> < Fe<sup>4+</sup>

23. When an electron is removed from an atom, its energy  
1) increases 2) decreases 3) remains the same 4) none of these
24. In the ions  $P^{3-}$ ,  $S^{2-}$  and  $Cl^{-}$ , the increasing order of size is  
1)  $Cl^{-}$ ,  $S^{2-}$ ,  $P^{3-}$  2)  $P^{3-}$ ,  $S^{2-}$ ,  $Cl^{-}$  3)  $S^{2-}$ ,  $Cl^{-}$ ,  $P^{3-}$  4)  $S^{2-}$ ,  $P^{3-}$ ,  $Cl^{-}$
25. Ionisation energy decreases down the group due to  
1) increase in charge 2) increase in atomic size  
3) decrease in size 4) decrease in shielding effect
26. Which one has least ionisation potential?  
1) Ne 2) N 3) O 4) F
27. Covalent radii of atoms varies in range of 72 pm to 133 pm from F to I while that of noble gases He to Xe varies from 120pm to 220pm. This is because in case of noble gases  
1) covalent radius is very large 2) van der Waal radius is considered  
3) metallic radii is considered 4) None of these
28. Ionic radii are  
1) inversely proportional to effective nuclear charge  
2) inversely proportional to square of effective nuclear charge  
3) directly proportional to effective nuclear charge  
4) directly proportional to square of effective nuclear charge
29. Which one of the following ions has the highest value of ionic radius ?  
1)  $O^{2-}$  2)  $B^{3+}$  3)  $Li^{+}$  4)  $F^{-}$
30. Atomic radii of fluorine and neon in Angstrom units are respectively given by  
1) 0.72, 1.60 2) 1.60, 1.60 3) 0.72, 0.72 4) None of these values
31. The screening effect of inner electrons of the nucleus causes  
1) decrease in the ionization energy 2) increase in the ionization energy  
3) no effect on the ionization energy 4) increases the attraction of the nucleus for the electrons
32. The second ionization potential is  
1) less than the first ionization potential. 2) equal to the first ionization potential.  
3) greater than the first ionization potential. 4) none of these
33. The pair of elements having approximately equal ionisation potential is  
1) Al, Ga 2) Al, Si 3) Al, Mg 4) Al, B
34. Which of the following option is incorrect with respect to ionic radii ?  
1)  $Ti^{4+} < Mn^{2+}$  2)  $^{35}Cl^{-} < ^{37}Cl^{-}$  3)  $K^{+} > Cl^{-}$  4)  $P^{3+} > P^{5+}$
35. Which of the following element has maximum, first ionisation potential –  
1) V 2) Ti 3) Cr 4) Mn

36. The van der Waal and covalent radii of fluorine atom respectively from the following figure are.



- 1) 219 pm, 72 pm 2) 75 pm, 72 pm 3) 147 pm, 72 pm 4) 147 pm, 144 pm
37. Which of the following has same size?  
1)  $Fe^{2+}$ ,  $Ni^{2+}$  2)  $Zr^{4+}$ ,  $Ti^{4+}$  3)  $Zr^{4+}$ ,  $Hf^{4+}$  4)  $Zn^{2+}$ ,  $Hf^{4+}$
38. The correct decreasing order of first ionisation enthalpies of five elements of the second period is  
1)  $Be > B > C > N > F$  2)  $N > F > C > B > Be$  3)  $F > N > C > Be > B$  4)  $N > F > B > C > Be$
39. Which is the correct order of second ionization potential of C, N, O and F in the following ?  
1)  $O > N > F > C$  2)  $O > F > N > C$  3)  $F > O > N > C$  4)  $C > N > O > F$
40. Which of the following statements is wrong ?  
1) van der Waal's radius of iodine is more than its covalent radius



- 2) All isoelectronic ions belong to same period of the periodic table  
 3) I.E.1 of N is higher than that of O while I.E.2 of O is higher than that of N  
 4) The electron gain enthalpy of N is almost zero while that of P is  $74.3 \text{ kJ mol}^{-1}$
41. The atomic sizes are not significantly different for the series of elements  
 1) Bi, Na, K, Rb                      2) Na, Mg, Al, Si              3) O, S, Sc, Te              4) Cr, Mn, Fe, Co
42. The correct sequence of the ionic radii of the following is  
 1)  $\text{Br}^- > \text{Cl}^- > \text{S}^{2-} > \text{O}^{2-} > \text{F}^-$                       2)  $\text{Br}^- > \text{S}^{2-} > \text{Cl}^- > \text{O}^{2-} > \text{F}^-$   
 3)  $\text{Br}^- > \text{S}^{2-} > \text{Cl}^- > \text{F}^- > \text{O}^{2-}$                       4) none of these
43. Ionization potentials of the following elements are in the order  
 1)  $\text{Al} > \text{Ga} > \text{In} > \text{Tl}$               2)  $\text{Al} > \text{Ga} > \text{Tl} > \text{In}$     3)  $\text{Al} \gg \text{Ga} > \text{In} > \text{Tl}$     4)  $\text{Al} \gg \text{Ga} > \text{Tl} > \text{In}$
44. Electron affinity is maximum for  
 1) Cl                                      2) F                                      3) Br                                      4) I
45. Consider the following four elements, which are represented according to long form of periodic table

	Y	
W	X	Z

- Here W, Y and Z are left, up and right elements with respect to the element 'X' and 'X' belongs to 16th group and 3<sup>rd</sup> period. Then according to given information the incorrect statement regarding given elements is:
- 1) Maximum electronegativity : Y                      2) Maximum catenation property : X  
 3) Maximum electron affinity : Z                      4) Y exhibits variable covalency
46. The electron affinity for the inert gases is  
 1) zero                                      2) high                                      3) negative                                      4) positive
47. An atom with high electronegativity has  
 1) large size                                      2) high ionisation potential  
 3) low electron affinity                      4) low ionisation potential
48. The stability of + 1 oxidation state increases in the sequence:  
 1)  $\text{Tl} < \text{In} < \text{Ga} < \text{Al}$                       2)  $\text{In} < \text{Tl} < \text{Ga} < \text{Al}$   
 3)  $\text{Ga} < \text{In} < \text{Al} < \text{Tl}$                       4)  $\text{Al} < \text{Ga} < \text{In} < \text{Tl}$
49. Halogens and chalcogens family have highly ...P.. electron gain enthalpy. Here, P refers to  
 1) negative                                      2) positive                                      3) zero                                      4) infinity
50. Which one of these is basic ?  
 1)  $\text{SiO}_2$                                       2)  $\text{SO}_2$                                       3)  $\text{CO}_2$                                       4)  $\text{Na}_2\text{O}$
51. Which of the following sequence correctly represents the decreasing acidic nature of oxides?  
 1)  $\text{Li}_2\text{O} > \text{BeO} > \text{B}_2\text{O}_3 > \text{CO}_2 > \text{N}_2\text{O}_3$                       2)  $\text{N}_2\text{O}_3 > \text{CO}_2 > \text{B}_2\text{O}_3 > \text{BeO} > \text{Li}_2\text{O}$   
 3)  $\text{CO}_2 > \text{N}_2\text{O}_3 > \text{B}_2\text{O}_3 > \text{BeO} > \text{Li}_2\text{O}$                       4)  $\text{B}_2\text{O}_3 > \text{CO}_2 > \text{N}_2\text{O}_3 > \text{Li}_2\text{O} > \text{BeO}$
52. Which one of the following is an amphoteric oxide ?  
 1)  $\text{Na}_2\text{O}$                                       2)  $\text{SO}_2$                                       3)  $\text{B}_2\text{O}_3$                                       4)  $\text{ZnO}$
53. An element X occurs in short period having configuration  $ns^2 np^1$ . The formula and nature of its oxide is  
 1)  $\text{XO}_3$ , basic                                      2)  $\text{XO}_3$  acidic  
 3)  $\text{X}_2\text{O}_3$ , amphoteric                                      4)  $\text{X}_2\text{O}_3$  basic
54. Which is chemically most active non-metal ?  
 1) S                                      2) O                                      3) F                                      4) N
55. Which is not the correct order for the stated property.  
 1)  $\text{Ba} > \text{Sr} > \text{Mg}$  ; atomic radius                      2)  $\text{F} > \text{O} > \text{N}$  ; first ionization enthalpy  
 3)  $\text{Cl} > \text{F} > \text{I}$  ; electron affinity                      4)  $\text{O} > \text{Se} > \text{Te}$  ; electronegativity
56. The correct order of acidic strength :  
 1)  $\text{Cl}_2\text{O}_7 > \text{SO}_2 > \text{P}_4\text{O}_{10}$                       2)  $\text{K}_2\text{O} > \text{CaO} > \text{MgO}$   
 3)  $\text{CO}_2 > \text{N}_2\text{O}_5 > \text{SO}_3$                       4)  $\text{Na}_2\text{O} > \text{MgO} > \text{Al}_2\text{O}_3$
57. The elements with zero electron affinity are  
 1) Boron and Carbon                                      2) Beryllium and Helium  
 3) Lithium and Sodium                                      4) Fluorine and Chlorine

58. Which is true about the electronegativity order of the following elements?  
 1)  $P > Si$                       2)  $C > N$                       3)  $Br > Cl$                       4)  $Sr > Ca$
59. The element having very high ionization energy but zero electron affinity is  
 1) H                      2) F                      3) He                      4) B
60. In the process,  $Cl(g) + e^- \xrightarrow{\Delta H} Cl^{-1}(g); \Delta H$  is  
 1) positive                      2) negative                      3) zero                      4) unpredictable

## NCERT LINE BY LINE QUESTIONS – ANSWERS

(1.)	d	(2.)	d	(3.)	b	(4.)	a	(5.)	d
(6.)	c	(7.)	a	(8.)	d	(9.)	d	(10.)	b
(11.)	c	(12.)	a	(13.)	a	(14.)	b	(15.)	a
(16.)	c	(17.)	c	(18.)	c	(19.)	d	(20.)	c
(21.)	c	(22.)	b	(23.)	d	(24.)	a	(25.)	c
(26.)	a	(27.)	b	(28.)	b	(29.)	c	(30.)	d
(31.)	b	(32.)	c	(33.)	d	(34.)	d	(35.)	b
(36.)	b	(37.)	a	(38.)	b	(39.)	b	(40.)	b
(41.)	a	(42.)	a	(43.)	b	(44.)	a	(45.)	b
(46.)	a	(47.)	b	(48.)	b	(49.)	a	(50.)	a

## TOPIC WISE PRACTICE QUESTIONS - ANSWERS

1) 4	2) 1	3) 3	4) 3	5) 2	6) 3	7) 4	8) 4	9) 3	10) 2
11) 3	12) 2	13) 3	14) 2	15) 4	16) 2	17) 2	18) 1	19) 2	20) 1
21) 1	22) 2	23) 1	24) 1	25) 2	26) 3	27) 2	28) 1	29) 1	30) 1
31) 1	32) 3	33) 1	34) 4	35) 4	36) 3	37) 3	38) 3	39) 2	40) 2
41) 4	42) 2	43) 4	44) 1	45) 4	46) 1	47) 2	48) 4	49) 1	50) 4
51) 2	52) 4	53) 3	54) 3	55) 2	56) 1	57) 2	58) 1	59) 3	60) 2

## NCERT LINE BY LINE QUESTIONS – SOLUTIONS

- (1.) (d) Beryllium is a metal, while silicon, germanium, arsenic, antimony and Tellurium are considered metalloids and they have characteristics of both metals and non-metals. The elements become more metallic as we go down a group, the nonmetallic character increases as one goes from left to right across the periodic table.
- (2.) (d) Among the given elements from period 2 of the periodic table, Ne has maximum first ionization enthalpy because of closed electron shells and very stable electron configurations.
- (3.) (b) According to Dobereiner's law of triads, the atomic weight of sodium is 23.

Assertion-Reason Type questions

- (4.) (a) The correct order of size of the given species is  
 $I^- > I > I^+$
- (5.) (d) The sixth period ( $n = 6$ ) contains 32 elements and successive electrons enter 6s, 4f, 5d and 6p orbitals, in the order of filling up of the 4f orbitals, it begins with cerium ( $z = 58$ ) and ends at lutetium ( $z = 71$ ) to give the 4f- inner transition series which is called the lanthanoid series.
- (6.) (c) The size of an anion will be larger than that of the parent atom because the addition of one or more electrons would result in increased repulsion among the electrons and a decrease in effective nuclear charge.
- (7.) (a)  $Al_2O_3$  is amphoteric oxide. Amphoteric oxides behave as acidic with bases and as basic with acidic.
- (8.) (d) The inner transition elements are all metals within each series, the properties of the elements are quite similar. The chemistry of the early actinoids is more complicated than the corresponding lanthanoids, due to the large number of oxidation states possible for these actinoid elements.
- (9.) (d) Element 106 has been named seaborgium (Sg) in his honour.
- (10.) (b) Reactivity of the group 1 elements increases down the group.
- (11.) (c) All the orbitals in the valence shell of the noble gases are completely filled by electrons and it is very difficult to alter this stable arrangement by the addition or removal of electrons. The noble gases thus exhibit very low chemical reactivity.
- (12.) (a) The period number in the long form of the periodic table is equal to maximum principal quantum number of any element of the period.

Assertion-Reason Type Questions

- (13.) 43.(a) The oxidation state of Al is +3 and the covalency is 6.
- (14.) (b) IUPAC official name and symbol of the element atomic number 109 is Meitnerium (Mt).
- (15.) (a)  $Na_2O$  – Basic  
 $Al_2O_3$  – Amphoteric  
 $N_2O$  – Neutral  
 $Cl_2O_7$  – Acidic

Assertion-Reason Type questions

- (16.) (c) Among the given periodic trends, atomic radius increases down the group. Remaining other trends, electronegativity, ionization enthalpy, electron gain enthalpy, decrease down the group.
- (17.) 20.(c) A quantitative measure of the tendency of an element to lose electron is given by its ionization enthalpy. It represents the energy required to remove an electron from an isolated gaseous atom in its ground state.
- (18.) (c) The elements gallium and germanium were unknown at the time Mendeleev published his periodic table.
- (19.) (d) The elements become more metallic as we go down a group, the non-metallic character increases as one goes from left to right across the periodic table.
- (20.) (c) The radii can be estimated by measuring the distance between cations and anions in ionic crystals.
- (21.) (c) A qualitative measure of the ability of an atom in a chemical compound to attract shared electrons to itself is called electronegativity.
- (22.) (b) In metal moving down the group metallic character increases so basic nature increases, hence most acidic will be BeO.



- (23.) (d) The order of filling up of the 4f orbitals begins with cerium (Ce) ( $z = 58$ ) and ends at lutetium (Lu) ( $z = 71$ ) to give the 4f - inner transition series which is called the lanthanoid series.
- (24.) (a) 3d series elements started from scandium ( $z = 21$ ) which has electronic configuration  $3d^1 2s^2$ . The 3d orbitals are filled at zinc ( $z = 30$ ) with electronic configuration  $3d^{10} 2s^2$ .
- (25.) (c) Electronegativity is not a measurable quantity, while ionization enthalpy and electron gain enthalpies are measurable quantity. However, a number of numerical scales of electronegativity of elements like Pauling scale, Mulliken-Jaffe scale, Allred-Rochow scale have been developed.
- (26.) (a) According to Mendeleev's periodic table, boron has formula  $B_2O_3$  or  $R_2O_3$ .
- (27.) (b) In general, ionization enthalpies decrease as we descend in a group.
- (28.) (b) Within a group, the reactivity increases down the group, whereas within group of non-metals, halogens, reactivity decreases down the group.
- (29.) (c) The p-block elements comprise with s-block elements are called the representative elements or main group elements.
- (30.) (d) Energy is always required to remove electrons from an atom and hence ionization enthalpies are always positive. The second ionization enthalpy will be higher than the first ionization enthalpy because it is more difficult to remove an electron from a positively charged ion than from a neutral atom.
- (31.) (b) Maximum 18 elements can be accommodated in the fifth period of the periodic table.
- (32.) (c)  $Na^+$ ,  $F^-$  and  $O^{2-}$  are isoelectronic species because it consists of same number of electrons.
- (33.) (d)
- |      |                       |
|------|-----------------------|
| Eu : | $[Xe] 4f^7 6s^2$      |
| Gd : | $[Xe] 4f^7 5d^1 6s^2$ |
| Tb : | $[Xe] 4f^9 6s^2$      |
- (34.) (d) The physical and chemical properties of the elements are periodic functions of their atomic numbers.
- (35.) (b) The d-block elements in the periodic table lie in the group from 3 to 12.
- (36.) (b) The distribution of electrons into orbitals of an atom is called its electronic configuration.
- (37.) (a) Among the given statements option (a) is correct with respect to electronegativity, metallic and non-metallic character of the elements.
- (38.) (b) In 1913 the English physicist Henry Moseley observed regularities in the characteristic X-ray spectra of the element. A plot of  $\sqrt{\nu}$  (where  $\nu$  is frequency of X-rays emitted) against atomic number ( $z$ ) gave a straight line and not the plot of  $\sqrt{\nu}$  vs atomic mass.
- (39.) (b) The second ionization enthalpy will be higher than the first ionization enthalpy because it is more difficult to remove an electron from a positively charged ion than from a neutral atom.
- (40.) (b) Fourth period ended with element of Krypton.
- (41.) (a) Among the given groups, halogen group of elements has highly negative electron gain enthalpies and readily add one electron to attain the stable noble gas configuration.
- (42.) (a) The cation with the greater positive charge will have a smaller radius because of the greater attraction of the electrons to the nucleus. Whereas the anion with the greater negative charge will have the larger radius.
- (43.) (b) Transition elements in the periodic table started from the atomic number ( $z = 21$ ), scandium.

- (44.) (a) The atomic size generally decreases across a period. It is because within the period the outer electrons are in the same valence shell and the effective nuclear charge increases as the atomic number increases, resulting in the increased attraction of electrons to the nucleus.
- (45.) (b) The two rows of elements at the bottom of the periodic table, called the lanthanoids Ce ( $Z = 58$ ) - Lu ( $Z = 71$ ) and actinoids, Th ( $Z = 90$ )-Lr ( $Z = 103$ ) are characterized by the outer electronic configuration  $(n-2)f^{1-14}(n-1)d^{0-1}ns^2$ . The elements after uranium are called trans-uranium elements.
- (46.) (a) The d-block, transition, elements exhibit variable oxidation states.
- (47.) (b) Correct order of electronegativity of the given elements is  $F > O > Na$ .
- (48.) (b)

Element	Electronegativity value
Si	1.8
S	2.5
Be	1.5
Mg	1.2

- (49.) (a) Electronic configuration of gadolinium (Gd) is  $[Xe] 4f^7 5d^1 6s^2$ .
- (50.) (a) Henry Moseley observed regularities in the characteristic x-ray spectra of the elements. A plot of  $\sqrt{\nu}$  (where  $\nu$  is frequency of x-rays emitted) against atomic number ( $Z$ ) gave a straight line and not the plot of  $\sqrt{\nu}$  vs atomic mass. He thereby showed that the atomic number is a more fundamental property of an element than its atomic mass.

## TOPIC WISE PRACTICE QUESTIONS - SOLUTIONS

- (4) Chloride formulas  
 (i) Eka-Aluminium =  $GaCl_3$  ( $ECl_3$ )  
 (ii) Eka-Silicon =  $GeCl_4$  ( $ECl_4$ )  
 Mendeleev arranged elements in horizontal rows and vertical columns of a table in order to their increasing atomic weights.
- (1) The s and p-block elements are collectively known as representative elements.
- (3) The magic number is 2, 8, 8, 18, 18, 32 according to which the elements are arranged in the periodic table. As the atomic number of the element is 10, so, it will resemble the elements with atomic number  $= 10 - 8 = 2$ ,  
 $10 + 8 = 18$ ,  $18 + 18 = 36$ ,  $36 + 18 = 54$ . This element resembles the element with atomic number 2, 54.
- (3) atomic number 9 is for F so its halogen series.
- (2)  $Z = 114$  belong to group 14, carbon family electronic configuration  $[Rn] 5f^{14} 6d^{10} 7s^2 7p^2$
- (3) Hydrogen is the most abundant element in the universe. The order of abundance of given elements in the universe is  $H > O > C > N$
- (4) Electronic configuration :  $[Kr] 4d^{10} 5s^1$ ; period =  $5^{th}$ ; group =  $10 + 1 = 11^{th}$
- (4) 38 is the atomic no. of strontium (Sr) which is s-block element and all the elements of s-block are metals.
- (3)
 

Digit	Name
1	un
4	quad

Using above notation IUPAC name of element 114 is Ununquadium.

10. (2) Electronic configuration of element with atomic number 118 will be  $[\text{Rn}]5f^{14}6d^{10}7s^27p^6$ . Since its electronic configuration in the outer most orbit ( $ns^2np^6$ ) resemble with that of inert or noble gases, therefore it will be noble gas element.
11. (3) Element with  $Z = 33$   
 $(1s^2 2s^2 p^6 3s^2 p^6 d^{10} 4s^2 p^3)$  lies in fifth (or  $15^{\text{th}}$ ) group.
12. (2)
13. (3) Halogens are most electronegative elements i.e., they are likely to form anions most readily.
14. (2) Its valence shell has 5 electrons ( $ns^2, np^3$ ). It belongs to 5th group of the periodic table.
15. (4) Barium has atomic number 56. It is an alkaline earth metal i.e., found in  $s$ -block.
16. (2) Na and Cl both belongs to III period.
17. (2) Cu, Ag and Au are coinage metals. They belong to group IB ( $d$ -block) of periodic table
18. (1) Seventh period includes most of the man-made radioactive elements.
19. (2)
20. (1) By observing principal quantum number ( $n$ ). Orbital ( $s, p, d, f$ ) and equating no. of  $e^-$ 's we are able to find the period, block and group of element in periodic table.
21. (1)  $\text{Tc}^{43}$  is the first artificial element.
22. (2)  $\text{F}^- < \text{O}^{2-} < \text{N}^{3-}$
23. (1) Energy is supplied in order to remove electron from atoms. So energy of atom increases when electron is removed from atom.
24. (1)
25. (2) When we move down the group, atomic size increases, distance between nucleus and valence shell electron increases and ionisation energy decreases.
26. (3) Ionisation potential increases while moving in a period.
- | Group V   | VI | VII | VIII |
|-----------|----|-----|------|
| Element N | O  | F   | Ne   |
- Oxygen (group 6) has low ionisation potential than N (group 5) because of stable configuration of nitrogen (half-filled  $p$ -orbital)
27. (2) In case of halogens covalent radius is considered this bond is formed by overlapping of electron clouds; while noble gases remain monoatomic, in this case only way to obtain radius is through van der Waal radii.
28. (1) Ionic radii are inversely proportional to effective nuclear charge.  
 Ionic radii in the  $n$ th orbit is given as
- $$r_n = \frac{n^2 a_0}{Z} \text{ or } r_n \propto \frac{1}{Z}$$
- when  $n$  = principal quantum number  
 $Z$ -effective nuclear charge.
29. (1)  $\text{O}^{--}$  and  $\text{F}^-$  are isoelectronic. Hence have same number of shells, therefore greater the nuclear charge smaller will be the size i.e.,  $\text{O}^{--} > \text{F}^-$   
 further  $\text{Li}^+$  and  $\text{B}^{3+}$  are isoelectronic. therefore  
 $\text{Li}^+ > \text{B}^{3+}$   
 Hence the correct order of atomic size is.  
 $\text{O}^{--} > \text{F}^- > \text{Li}^+ > \text{B}^{3+}$
30. (1) (i) Noble gases do not have covalent radii. They have only van der Waal's radii.  
 (ii) Covalent radii is always smaller than corresponding van der Waal's radii  
 Atomic radius of neon being van der Waal's radius is larger than that of fluorine which is in fact is its covalent radius.
31. (1) Higher the screening effect, lower is the I.E.

32. (3) Greater than the first ionization energy because after removal of one  $e^-$ , effective nuclear charge increases.
33. (1) In case of Ga there are 10d-electrons in the penultimate energy shell which shield the nuclear charge less effectively, the outer electron is held firmly by nucleus. As a result, the ionisation energy remains nearly the same as that of aluminium inspite of the fact that atomic size increases.
34. (4)  $P^{5+}$  has more effective nuclear charge and smaller size than  $P^{3+}$ .
35. (4)  $[Ar]3d^5 4s^2$  due to half-filled configuration ( $d^5$ ), higher energy is required to removal of electron compared to other elements.
36. (3) Covalent radius is radius of an atom in its bound state i.e., in fluorine it is half of distance between two covalently bonded fluorine atoms; van der Waal radii is one-half of the distance between the nuclei of two identical non-bonded isolated atoms. These atoms are attracted toward each other through weak van der Waal's force hence van der Waal radii are very large.
37. (3) In general, the atomic and ionic radii increases on moving down in a group. But the element of second transition series (eg., Zr, Nb, Mo etc.) have the almost same radii as the elements of third transition series (eg. Hf, Ta, W etc.). This is because of lanthanide contraction.
38. (3) As we move along the period, the atomic size decreases due to increase in nuclear charge. Therefore, it is more difficult to remove electron from an atom. Hence the sequence of first ionization enthalpy in decreasing order is  
 $F > N > C > B > Be$   
 But ionization enthalpy of boron is less as compared to beryllium because first electron in boron is to be removed from p-orbital while in beryllium, is to be removed from s-orbital. As s-orbital is closer to nucleus in comparison to p-orbital thus energy required to remove an electron from s-orbital is greater.
39. (2) The second ionization potential means removal of electron from cation  
 $C^+ = 1s^2 2s^2 2p^1, N^+ = 1s^2 2s^2 2p^2$   
 $O^+ = 1s^2 2s^2 2p^3, F^+ = 1s^2 2s^2 2p^4$   
 Therefore  $O > F > N > C$
40. (2) In the isoelectronic species, all isoelectronic anions belong to the same period and cations to the next period.
41. (4) The decrease in size of inner d-subshell due to added electrons and their shielding effect on the outer most electrons from the nuclear charge almost compensate for Cr, Mn, Fe and Co.
42. (2) Radii of anions carrying same charge decrease from left to right in a period and increase down the group.
43. (4) Barring few exceptions, ionization potential decreases down the group.
44. (1) Electron affinity is energy released when electron is added to isolated gaseous atom. Its value decreases down the group. So electron affinity of F should be highest among halogens but due to its smaller size electron affinity of Cl is more than F.  
 $\therefore$  Cl has highest electron affinity.
45. (4)  

W : Phosphorus	Y : Oxygen	X : Sulphur	Z : Chlorine
Electronegativity	$O > Cl > S > P$	Catenation :	$S > P > O > Cl$
Electron Affinity :	$Cl > O > S > P$	Oxygen exhibits covalency of two only	
46. (1) Zero, because of the stable electronic configuration the noble gases do not show any force of attraction towards the incoming electron.
47. (2) An atom with high electronegativity has high IP.
48. (4) The stability of +1 oxidation state increases from aluminium to thallium i.e.  
 $Al < Ga < In < Tl$
49. (1) The halogen (group-17) and the chalcogens (group-16) are two groups of elements having highly negative electron gain enthalpies.
50. (4) Basicity of oxides decreases in a period from left to right.  $Na_2O$  is basic oxide,  $CO_2$ ,  $SiO_2$  and  $SO_2$  are acidic oxides. Alternatively, oxides of metals (e.g.,  $Na_2O$ ) are basic, while oxides of non-metals ( $SO_2$ ,  $SiO_2$  and  $CO_2$ ) are acidic.

51. (2) On passing from left to right in a period acidic character of the normal oxides of the elements increases with increase in electronegativity.
52. (4)  $\text{Na}_2\text{O}$  (basic),  $\text{SO}_2$  and  $\text{B}_2\text{O}_3$  (acidic) and  $\text{ZnO}$  is amphoteric.
53. (3)  $ns^2 p^1$  is the electronic configuration of III A period.  
 $\text{Al}_2\text{O}_3$  is amphoteric oxide.
54. (3)  $\text{F}_2$  has highest electronegativity, so it is chemically most active non metal.
55. (2) On moving along the period, ionization enthalpy increases. In second period, the order of ionization enthalpy should be as follows :  
 $\text{F} > \text{O} > \text{N}$ .  
 But N has half-filled structure, therefore, it is more stable than O. That is why its ionization enthalpy is higher than O. Thus, the correct order of IE is  
 $\text{F} > \text{N} > \text{O}$ .
56. (1) Acidic character of oxide  $\propto$  Non-metallic nature of element. Non-metallic character increases along the period. Hence order of acidic character is  
 $\text{Cl}_2\text{O}_7 > \text{SO}_2 > \text{P}_4\text{O}_{10}$ .
57. (2) Fully filled electronic configuration
58. (1)  $\text{P} > \text{Si}$  electronegativity increases along the period.
59. (3) He has zero EA because of its completely filled subshells ( $1s^2$ ).
60. (2) The process represents the first electron affinity which is always exothermic. Hence  $\Delta H$  is negative.



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Design Thinking & Innovation



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Information Technology



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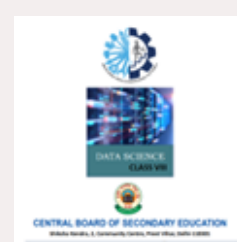
Mass Media - Being Media Literate



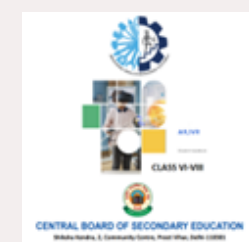
Travel & Tourism



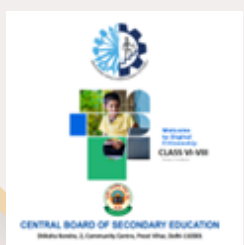
Coding



Data Science (Class VIII only)



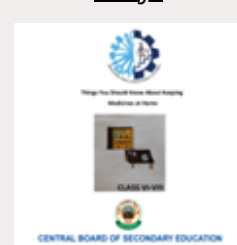
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Digital Citizenship



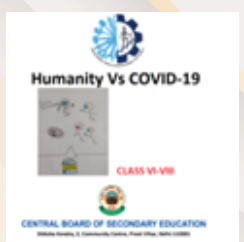
Life Cycle of Medicine & Vaccine



Things you should know about keeping Medicines at home



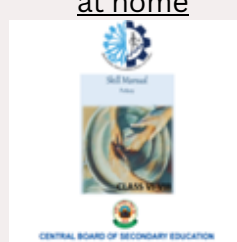
What to do when Doctor is not around



Humanity & Covid-19



Blue Pottery



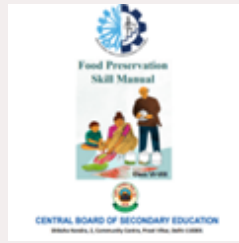
Pottery



Block Printing



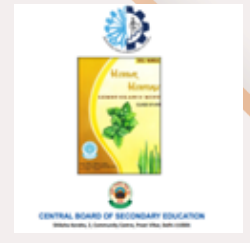
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Food Preservation



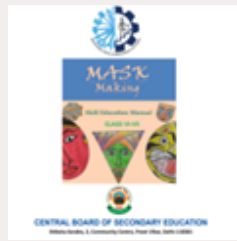
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Herbal Heritage



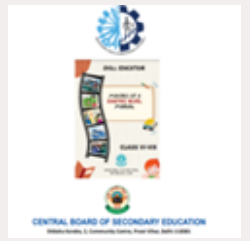
Khadi



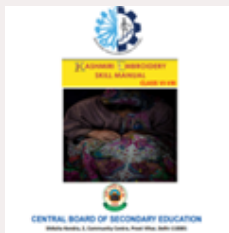
Mask Making



Mass Media



Making of a Graphic Novel



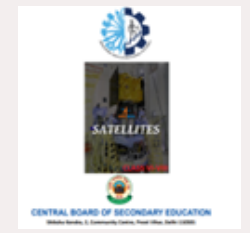
Kashmiri Embroidery



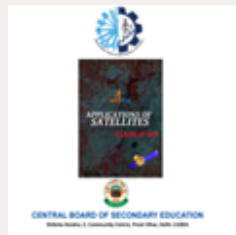
Embroidery



Rockets



Satellites

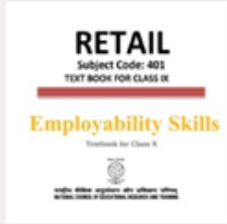


Application of Satellites

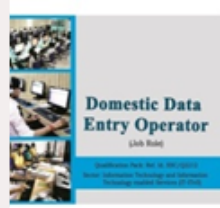


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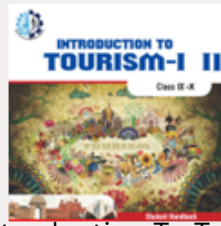
Security



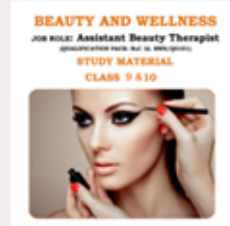
Automotive



Introduction To Financial Markets



Introduction To Tourism



Beauty & Wellness



Agriculture



Food Production



Front Office Operations



Banking & Insurance



Marketing & Sales



Health Care



Apparel



Multi Media



Multi Skill Foundation Course



Artificial Intelligence



Physical Activity Trainer



Data Science



Electronics & Hardware (NEW)



Foundation Skills For Sciences (Pharmaceutical & Biotechnology)(NEW)



Design Thinking & Innovation (NEW)



# SKILL SUBJECTS AT SR. SEC. LEVEL (CLASSES XI – XII)



Retail



Information Technology



Web Application



Automotive



Financial Markets Management



Tourism



Beauty & Wellness



Agriculture



Food Production



Front Office Operations



Banking



Marketing



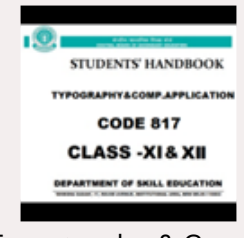
Health Care



Insurance



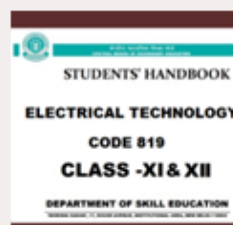
Horticulture



Typography & Comp.  
Application



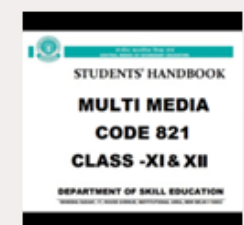
Geospatial Technology



Electrical Technology



Electronic Technology



Multi-Media



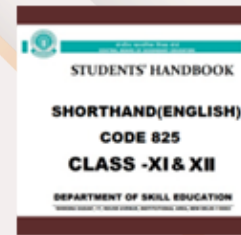
Taxation



Cost Accounting



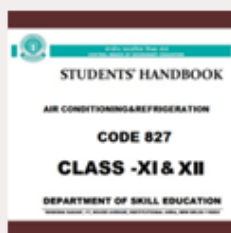
Office Procedures & Practices



Shorthand (English)



Shorthand (Hindi)



Air-Conditioning & Refrigeration



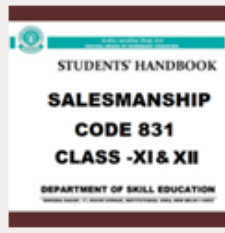
Medical Diagnostics



Textile Design



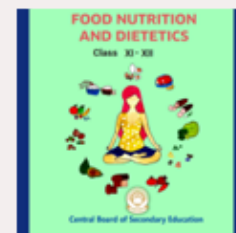
Design



Salesmanship



Business Administration



Food Nutrition & Dietetics



Mass Media Studies



Library & Information Science



Fashion Studies



Applied Mathematics



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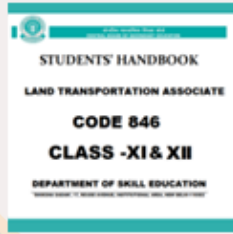
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Data Science



Physical Activity Trainer(new)



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